REMARKS

Initially, Applicants respectfully wish to thank Examiner Opsasnick for confirming receipt of Applicants claim for foreign priority under 35 U.S.C. § 119 and for acknowledging that certified copies of the priority documents were received in Applicants' parent application No. 09/101,186. Additionally, Applicants wish to thank the Examiner for considering each of the documents cited in the Information Disclosure Statements filed in the present application.

In the Official Action the Examiner rejected claims 1-16 under 35 U.S.C. § 102(e) as being anticipated by OZAWA (U.S. Patent No. 5,826,226). The Examiner further rejected claims 17-20 under 35 U.S.C. § 103 as unpatentable over OZAWA in view of TZENG (U.S. Patent 5,293,449). Applicants respectfully traverse each of the above rejections and assert that they are inappropriate. Applicants submit that the Examiner has not set forth a proper basis for rejection of any of these claims.

Applicant respectfully submits that OZAWA does not contain a disclosure that is appropriate for the rejection of any of the claims in the present application. In this regard, the Examiner asserts that OZAWA teaches a fixed waveform storage system capable of storing one or more fixed waveforms as codebook storage information for synthesis. In this regard, the Examiner cited column 11, lines 1-30. Applicants respectfully traverse and submit that the Examiner's understanding of the reference and the claims of the pending application are incorrect. In particular, Applicants respectfully submit that the codebook of OZAWA is a pulse amplitude codebook. Thus, it does not contain one or more fixed

waveforms. Rather, the codebook of OZAWA contains polarity information of plural pulses. On the other hand, the present invention, as recited in the claims, utilizes a fixed waveform for generating an excitation vector.

The Examiner further asserts that OZAWA teaches a convolution system capable of convoluting the fixed waveforms with the input vector to output an excitation vector as a convolution calculation utilizing the codebook. In this regard, the Examiner cites column 7, lines 4-30. The Examiner's interpretation of the OZAWA reference in this regard is submitted to be inappropriate.

The convolution of OZAWA relates to a speech synthesis filter. In the CELP (Code Excited Linear Predictive Coding) method, an adaptive codebook search procedure, which selects or determines a pitch period of the excitation signal, is generally performed according to error values in the synthesized speech domain. Therefore, each candidate vector of the adaptive codebook is generally synthesized in the codebook search procedure. In other words, in the codebook search procedure, a candidate vector is convoluted with an impulse response of the synthesis filter.

In direct contrast, the convolution of the present invention is a process for generating the excitation vector, as explicitly recited in at least claim 1.

In particular, as recited, inter alia, in claim 1, the present invention is directed to an excitation vector generator comprising, inter alia, a convolution system capable of convoluting the at least one fixed waveform with the input vector to generate an excitation vector.

Although "convolution" is used both in OZAWA and in the present invention, the object of the convolution is completely different. Particularly, the excitation vector generated by the present invention, which is generated by the convolution between the input vector and at least one fixed waveform, is further convoluted with a impulse response of the synthesis filter to obtain a synthesized speech. However, in OZAWA, as noted above, a candidate vector is convoluted with an impulse response of the synthesis filter.

Accordingly, based on the above, both the operating objectives and the purposes of the calculations of the present application and the OZAWA disclosure are significantly different and, thus, OZAWA is an inappropriate basis for the rejection of the claims.

With regard to claims 2 and 3 of the present application, the Examiner makes reference to the convolution equation at column 7. However, as noted above, the mere utilization of convolution processing does not satisfy the terms of Applicants' claims. Applicants' convulsion processing is, as noted above, utilized to convolute the at least one fixed wave form with the input vector to obtain, as a output, the excitation vector. This is not the case with the convolution system of OZAWA which convolutes an impulse response of a synthesis filter together with an excitation vector.

With respect to claim 4, the Examiner asserts that OZAWA teaches at column 6, line 61-66 the utilization of an algebraic codebook. However, OZAWA merely discloses an adaptive codebook circuit rather than an algebraic codebook as recited in Applicants' claim.

Regarding claim 6, the Examiner asserts that OZAWA discloses a plurality of fixed waveforms as LSP storage codebook containing multiple LSP parameters on the subframe

(column 5, lines 54-63). However, the LSP parameters disclosed by OZAWA are not particularly relevant to the present invention.

In this regard, Applicants note that CELP, to which OZAWA and the present invention are directed, is a method for coding and decoding that can be used for modeling human speech. Generally speaking, the speech coding/decoding is performed by using two information parameters. The first parameter, voice source information, expresses air flow through the lung (which is controlled by vibration of the vocal cords) while the second parameter, vocal tract information (which corresponds to the spectrum envelope information), expresses resonance which results from a change in the shape of the throat and mouth. These basic principles of CELP are well-known to people skilled in the art of CELP coding/decoding. In this regard, Applicants note that the present invention relates to an excitation vector generator for precisely expressing voice source information. On the other hand, the LSP parameters pointed out by the Examiner are utilized for expressing vocal tract information. Thus, the claims and the LSP referenced by the Examiner are two different parameters, each utilized for modeling the human voice, but are not directly related to each other. This essential difference underlies the shortcomings of the reference applied by the Examiner and provides further evidence of the patentability of the claims pending in the present application. Accordingly, Applicants respectfully submit that the Examiner's rejection of claims 1-16 as anticipated by OZAWA under 35 U.S.C. § 102(e) is inappropriate. Accordingly, reconsideration and withdrawal thereof is respectfully requested.

The Examiner rejected claims 17-20 under 35 U.S.C. § 103 as unpatentable over OZAWA in view of TZENG. Applicants respectfully traverses the above rejection and submits that it is based upon an inappropriate interpretation of the references. As noted above, the Examiner's interpretation of OZAWA is inappropriate and in error. The Examiner's interpretation of the TZENG references is also inappropriate. TZENG fails to disclose, teach, or suggest the generation of an excitation vector by convoluting an impulse vector with a fixed waveform.

In particular, TZENG discloses a CELP system that utilizes two different codebooks. An output from either of the two codebooks is selected as an excitation vector and is used for speech synthesis. Thus, large amounts of information must be stored in each codebook, which has obvious disadvantages. In this regard, the Examiner's attention is respectfully directed to Figure 4 which shows the codebooks 408 and 410 as well as the switching means 407. Since, according to the teachings of TZENG an output from one of the codebooks is utilized as the excitation vector without modification, the codebook data must be extremely large.

In direct contrast, the modified excitation vector for the present invention, which is obtained by modifying an energy distribution of an input vector with fixed waveforms stored in a storage system is not taught or disclosed by TZENG. TZENG does not disclose storing fixed waveforms in a storage system used for modifying the input vector as explicitly recited in Applicants' claims.

Accordingly, it is quite clear that there is no basis for the Examiner's rejection of claims 17-20 under 35 U.S.C. § 103 as unpatentable under OZAWA in view of TZENG.

For each of these reasons, and certainly for the above reasons, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections, together with an indication of the allowability of all the claims pending in the present application, in due course. Such action is respectfully requested and is now believed to be appropriate and proper in view of the herein contained remarks.

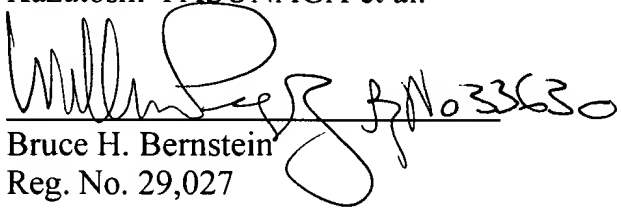
SUMMARY AND CONCLUSION

Upon entry of the present Response, the claims will not have been amended. Thus, claims 1-20 remain pending.

By the present Response, Applicants have discussed the disclosures of the references cited against the claims in the present application and have pointed out the significant and substantial shortcomings thereof. Applicants have further discussed the explicit recitations of the claims of the present application (independent and dependent) and, with reference thereto, have noted the features not disclosed, taught or rendered obvious in the references. Thus, Applicants have provided a clear evidentiary basis for the patentability of all the claims in the present application and respectfully request that indication to such effect, in due course.

Should the Examiner have any questions or comments regarding the present Response or this application, the Examiner is respectfully requested to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
Kazutoshi YASUNAGA et al.



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